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The Wirt Universal Theatre Dimmer.

The conditions encountered in the installation of Theatre Dimmers demand such a variety of types, and so many different arrangements and combinations, as to make nearly every installation a special undertaking, requiring work differing in some respects from standard. This not only increases the expense, but occasions delay and uncertainty in filling orders, besides making the work more or less experimental.

These considerations have led us to design a type of dimmer permitting the utmost flexibility in installing, while still maintaining a standard of construction. The further advantages gained are extreme ease of operation and compactness.

The Wirt Universal Dimmers possess many points of merit not before secured. The advantages will be best understood by referring to the illustrations. Figure 16 represents three views of a single unit, showing the dimmer on the back of the board and the interlocking mechanism, together with the master lever, and a portion of the interlocking shaft on the front of the board.

On the interlocking shaft is a loose sheave connected, by means of a very flexible steel cable, to a similar sheave on the shaft of the dimmer plate. This latter shaft also carries the dimmer switch. A lever and handle are attached to the loose sheave for operation of the corresponding dimmer independently of the other dimmers.

A slotted cam permanently attached to the interlocking shaft near each loose sheave engages with a spring plug on the corresponding lever (providing the lever handle is so turned as to permit of such engagement). By giving the handle a quarter turn the spring plug is disengaged from the cam and the lever is free to move, thereby allowing the operator to raise or lower the lights controlled by that dimmer. In this way any circuit may be controlled independently of all other circuits.

If, however, it is desired to operate several of the dimmers on the interlocking shaft at one time, the corresponding lever handles are not turned. Then as many of them as are desired will be picked up by their cams in whatever position they have been left and the corresponding lights raised or lowered simultaneously. A master lever is provided for this purpose on each interlocking shaft. Fig. 17 is a plan of a board upon which are mounted 24 Wirt Universal Theatre Dimmers. The plan shown here is one well suited to the conditions generally encountered. A similar outfit is illustrated by Fig. 18.

The board, of marble or enameled slate, has on its face three horizontal interlocking shafts, each one carrying operating levers and interlocking cams for 8 dimmers. The dimmers are placed back of the board. The 8 dimmers controlled by the levers on the upper interlocking shaft are for white-light circuits—auditorium, foot, proscenium and 5 borders. Those on the middle shaft for red-light circuits and bunch lights, as follows:—bunch No. 1, bunch No. 2, foot and 5 borders. The lower shaft controls the same two bunch-light dimmers as are on the middle shaft and also the blue lights, as follows:—bunch No. 1, bunch No. 2, foot and 5 borders. Each interlocking shaft has a master lever.

At the left end of the board is a vertical gang shaft to permit of simultaneous operation of two or three of the interlocking shafts. This gang shaft may be thrown entirely out when it is desired to operate the interlocking shafts directly.

A worm and wheel is provided for slow motion when the gang shaft is used. A heavy fly wheel on the worm aids in securing a smooth motion. The gearing on the gang shaft is supplied with interlocking attachments to permit of reversing the direction of any interlocking shaft with respect to any other one. This enables any color to be automatically raised while another color is being lowered, or *vice versa*.

Each master lever is interlocked on the shaft in such a manner as to permit of its being disengaged when not in use and thrown into a clip against the board.

As stated above, the bunch lights may be controlled from either the middle or lower interlocking shaft. This arrangement allows the bunch lights to be dimmed with any color or raised when any color is lowered. This arrangement of the lights in three banks permits of every possible combination, and enables any light effect to be secured.

Fig. 19 illustrates a similar outfit, but in this case the dimmers have been placed above the switch board, and the board itself has been considerably reduced in size—measuring, in fact, only 2 feet in height and 4½ feet in length. This disposal of the dimmers allows the controlling board to be placed almost flat against the proscenium wall.

Fig. 20 shows an arrangement where all of the dimmers are on a single interlocking shaft. In this case the dimmers controlling the red lights may be reversed in direction so that they may be operated against either the white or blue lights. Fig. 21 is an illustration of another arrangement wherein all of the circuit switches are on the same board as the dimmer controlling levers.

Each circuit switch is alongside of the corresponding dimmer, and may therefore be easily located by the operator. A "bull" switch is also provided at the end of each interlocking shaft for cutting out or throwing in all lights of one color. With this board all dimmers are below the stage floor, the controlling mechanism only appearing on the face of the board.

Among the many advantages possessed by the Wirt Universal Dimmers are :—

Compactness. They occupy about one-half the space usually called for, and when the dimmers are placed above or below the board they demand a still smaller space.

Completeness. Practically, any light effect may be secured, and the small size of the board places everything within easy reach of a single operator.

Ease of Operation. This is partially due to the thorough mechanical construction of the switch and commutator on each dimmer. The radius of the switch arm is but 2½ inches, and therefore, with a given pressure, it is more easily rotated than in the usual dimmer, where it is nearly as long as the operating lever. A single operator can throw the entire bank of dimmers with very slight effort. The switch is a leaf brush, giving the best contact with the least pressure.

Accessibility of all parts for examination or repairs.

All parts on the controlling board are mechanically well made and strong. They are finished either full nickel or copper. All necessary adjustments are provided. Provision is also made for removing or replacing the steel cables, or taking them up should they become slack. This has so far, however, been found an unnecessary precaution, since the small amount of work which any cable is called upon to do does not appreciably stretch it.

Owing to the particular requirements to be met in laying out each dimmer board it is impossible to give list prices, but upon furnishing the necessary information as to the size and number of dimmers we shall be pleased to submit sketch, showing a complete plan, and quote prices.

THE WIRT ELECTRIC CO.

PHILADELPHIA, U. S. A.

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We point particularly to the following details in the construction of Wirt Dimmers:—

No Enamel, which is likely to crack upon the application of a sudden load or heavy overload.

No Filler, such as sand or cement, which, from its hygroscopic nature, absorbs moisture and either rusts out the dimmer or permits electrolytic action to destroy it.

Mica Insulation throughout, the best insulator and the only one capable of indefinitely withstanding damp and the sudden and excessive temperature changes.

No Small Parts, such as nuts, pins, washers and short connecting wires at the contact points. These eventually loosen and the dimmer breaks down.

No Soldered or Twisted joints in the rheostat.

Direct Contact of resistance with commutator bars.

Completely Encased in iron, affording ample protection against injury, and offering the utmost active radiating surface.

Commutator and Switch mechanically perfect and thoroughly protected against injury.

Large Number of Steps, no dimmer having less than fifty.

The Resistance Material is a continuous ribbon wound *without break* or *joint* into the desired number of steps, never less than fifty. These fifty or more steps make direct contact with the commutator bars, no connecting wires, no twisted, screwed or soldered joints.

The Resistance is Tapered according to the heat-radiating capacity desired at each point.

The Steps are Graded in proportion to the current capacity required. This provides a large switch contact where the current is large and a small contact where the current is small.

The resistance ribbon lies *flat* against the radiating plates, the only substance intervening being a thin sheet of insulating mica. This construction permits the heat to be most readily conducted to the external surface and thence dissipated. The result is that the resistance material always runs comparatively cool, a condition which best fortifies it against injury in case of an accidental overload.

The perfect method of distributing the heat by means of tapering the resistance and grading the steps enables each plate to work at its greatest efficiency, and therefore permits a heavier load for the size of plate than is possible under any other conditions.

The resistance itself, tapered from one end to the other, gives the greatest capacity where the current demands it, and offers, besides, steps of low resistance when the lamps are bright and steps of high resistance when the lamps are dim. This produces a dimming effect equal to that which would ordinarily be gained by having 200 steps.

We call particular attention to the mechanical construction of commutator and switch. The contacts are not the usual series of round buttons, but are rectangular blocks lying in close proximity. This offers the greatest area of contact with the switch. The areas of these bars are not the same, but increase proportionately with the increase in current to be carried.

The switch, instead of being a simple strip of spring brass, as usually found, is a *leaf brush*, insuring a perfect contact with least pressure. Moreover, the short radius of the switch arm permits of a firm pressure without its offering but the slightest resistance to the operation of the dimmer. This insures cool running contacts, and, together with the laminated switch, good wearing qualities.

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